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AILEG Analysis and Investment for Low-Emission Growth

Nationally Appropriate Mitigation Actions (NAMAs) in Vietnam: Workshop Proceedings

The AILEG Project

Contract No. EEM-I-00-07-00004-00
Task Order No. AID-OAA-TO-11-00041

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TERMS AND ABBREVIATIONS

AILEG	Analysis and Investment for Low-Emission Growth
ADB	Asian Development Bank
BenMAP	Environmental Benefits Mapping and Analysis Program
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
DARD	Department of Agriculture and Rural Development
DSO	District Statistics Office
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
EE	Energy Efficiency
EF	Emissions Factor
FAO	United Nations Food and Agriculture Program
FiT	Feed-in Tariff
GHG	Greenhouse Gas
GSO	General Statistics Office
GVN	Government of Vietnam
ICT	Information and Communications Technology
IEA	Institute for Agricultural Environment
JEDI	Jobs and Economic Development Impact (model)
JICA	Japan International Cooperation Agency
LEDS	Low-Emission Development Strategies
MARD	Ministry of Agriculture and Rural Development
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NREL	US Department of Energy (DOE) National Renewable Energy Laboratory
PSO	Provincial Statistics Office
RE	Renewable Energy
SRI	System of Rice Intensification
SOW	Scope of Work
UNDP	United Nations Development Programme

UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USG	United States Government
VCEP	Vietnam Clean Energy Program (USAID)
WRI	World Resources International

EXECUTIVE SUMMARY

This report highlights the outputs of the AILEG Stakeholder Workshop on Nationally Appropriate Mitigation Actions (NAMAs) in Vietnam hosted at the Sheraton Hotel in Hanoi on May 23-24, 2013. A total of 75 participants attended, representing the Government of the Vietnam (GVN), the private sector (NGOs and private companies), and international donors. There were 39% female and 61% male participants.

Welcoming remarks came from Mr. Nguyen Khac Hieu (the Deputy Director General of DMHCC, MONRE) and Ms. Rosario "Chato" Calderon (USAID Vietnam). Mr. Hieu stressed the importance of creating and establishing a policy mechanism for NAMAs, which has yet to be accomplished in Vietnam. He explained that this workshop arose from discussions with USAID, in which MONRE identified wind and biogas as priority activities for NAMA policy development. Mr. Hieu noted his hope that this workshop would facilitate the implementation of NAMAs so that Vietnam can spur low carbon growth and develop a green economy. Ms. Calderon highlighted NAMAs as a significant policy mechanism that can be leveraged to reduce GHG emissions, create jobs, and encourage economic growth in Vietnam. She hoped that the workshop would provide the necessary technical knowledge to further the development of NAMAs in Vietnam.

To frame the discussion of tools to support the successful development and implementation of NAMAs, panel discussions and presentations provided background context on the importance of NAMAs for mitigating climate change. Mr. Nguyen Khac Hieu gave a presentation on Vietnam's emissions profile and provided a snapshot of the relevant social, economic, and environmental profile as it pertains to GHG emissions and the development of NAMAs. Mr. Matthew Ogonowski (USAID/Washington) presented an overview of NAMAs focusing on their background, financing mechanisms, key features, and challenges. T Dr. Dinh Vu Thanh(MARD) and Mr. Quach Tat Quang (MONRE) explained the importance of developing robust NAMAs in Vietnam and the government's priorities for biogas and wind technologies.

Ms. Jette Findsen (Abt Associates) presented the results of an AILEG study on biogas technology in Vietnam, which addressed the technological feasibility, economic and financial costs, potential supply and demand of energy to households, financing mechanisms, and environmental considerations. She also presented case studies of biogas NAMAs in Uruguay, Costa Rica, and Ethiopia. Mr. Dan Bilello from the US Department of Energy's National Renewable Energy Lab (NREL) discussed the potential for a NAMA on wind and the history of wind technology in Vietnam, and barriers to implementation. Bilello and Findsen presented cross-cutting considerations for NAMA development, highlighting financial, economic, social, and environmental considerations that should be incorporated in a NAMA.

Day 2 began with a re-cap by of Day 1 by Ogonowski. Day 1 set the stage for Day 2's more technical discussions and provided the "What, Why, and When" of biogas and wind technology in Vietnam. Day 2 focused on howto use tools, models, and methods to support NAMAs through accurate estimation of co-benefits, design and development of Measurement, Reporting, and Verification (MRV) system, and calculation of the economic, social, and environmental impact of polices. He stressed the importance of this workshop to build technical capacity on developing robust NAMAs for wind and biogas to establish Vietnam as a global leader in this area.

To set the stage for the tools, models, and methods presented later in the morning, Ms. Findsen presented an overview of the potential impacts a given mitigation action may have on the various sectors and stakeholders within Vietnam. Ms. Apurba Mitra from the World Resources Institute (WRI) then presented the GHG emissions accounting framework under development by WRI with a large group of international stakeholders. She emphasized the importance of these tools in establishing a credible MRV system to improve the attractiveness of NAMAs to providers of external financial, capacity development, and technology transfer support.

A series of panel presentations demonstrated additional tools and models to evaluate co-benefits of NAMA policies, as follows:

- Mr. Bilello noted that when a country undertakes mitigation activities, the benefits often extend far beyond GHG emissions reductions. Using the wind deployment sector as an example, he highlighted economic, social, and environmental co- benefits of policy changes. Although evaluating the co-benefits can be challenging, they are often very significant and may dwarf the benefits of GHG emissions reductions. Therefore, mitigating activities may be attractive options even in the absence of nationally or internationally mandated emission abatement goals.

Ms. Findsen presented a summary of potential tools and methodologies for estimating the air quality and health co-benefits of NAMAs. She noted that these co-benefits are often largest for transportation, policies to reduce coal consumption, and energy efficiency.

However, some activities such as biomass energy, have both positive and negative externalities.

Mr. Quang provided closing remarks. He encouraged Ministries to continue to look into NAMAs when they returned to their jobs and expressed his hope that the technical knowledge and momentum built up during this workshop would continue. Mr. Quang expressed his optimism that the collaboration facilitated at the workshop will contribute to the movement towards NAMAs on a national scale in Vietnam. Mr. Quang thanked the organizers, donors, participants, speakers, and USAID for their involvement in this very important workshop. And finally, he requested USAID continue to support activities that can promote the development of NAMAs in Vietnam.

The workshop concluded with Mr. Ogonowski and Ms. Calderon of USAID thanking the participants and MONRE, MOIT and MARD for their leadership in helping the Government of Vietnam move forward along a low emissions development pathway.

WORKSHOP PROCEEDINGS

Day 1 Agenda

WELCOMING REMARKS

Mr. Nguyen Khac Hieu, *Deputy Director General*

DMHCC, MONRE

Deputy Director Hieu welcomed the participants and thanked USAID and the AILEG program for helping Vietnam address climate change and further the dialogue on NAMAs through this workshop.

Nationally Appropriate Mitigation Actions arose out of the Bali Action Plan and were agreed to during the United Nations Framework Convention on Climate Change in December 2007. Mr Hieu discussed enacted and proposed legislation to support the development and implementation of NAMAs in Vietnam, including the Green Growth Strategy. He stressed the importance of creating a policy mechanism for NAMAs, which needs to be developed in Vietnam. This workshop arose from discussions with USAID in which MONRE identified wind and biogas as priority activities for NAMAs. M

OPENING REMARKS

Ms. Rosario "Chato" Calderon, *Senior Climate Change Advisor*

General Development Office, USAID/Vietnam Mission

Ms. Calderon welcomed participants to this important workshop. She stressed that NAMAs are a significant policy mechanism that can simultaneously be leveraged to reduce GHG emissions, create jobs, and encourage economic growth in Vietnam. She provided participants with a brief overview of USAID's EC-LEDS program and the Analysis and Investment for Low Emissions Growth (AILEG) project, which organized the workshop.

Ms. Calderon noted that 28 potential mitigation options in agriculture, LULUCF, and energy have been proposed by the GVN in its Second National Communication to the UNFCCC. These activities have the potential to mitigate over 3,270 million tons CO_2-equivalent emissions.

PRESENTATION OF VIETNAM'S EMISSIONS PROFILE

Mr. Nguyen Khac Hieu, *Deputy Director General*

DMHCC, MONRE

Mr. Hieu gave an overview of recent demographic and economic trends in Vietnam to establish a common understanding of the factors influencing policy priorities. The current population is 87 million people. GDP growth was 5.89 percent in 2011. Mr. Hieu provided a snapshot of the market share of key industrial sectors contributing to GHG emissions, including agriculture, industry, forestry, and waste. Agriculture plays a major role in economic output and contributed 43 percent of national GHG emissions. Rice cultivation is particularly important in economic growth and GHG emissions. Forestry has the potential to serve as both an emissions source and sink, although the sector emitted a net 15 million tons CO_2-equivalent emissions in 2000. Energy comprised 35 percent of national GHG emissions.

The last publicly available national GHG inventory is for the year 2000 and followed the 1996 IPCC Guidelines. Data limitations necessitated the use of default IPCC emissions factors, rather than country-specific emissions factors for all sectors except methane emissions from rice paddies.

Mr. Hieu stressed that information and activity data for GHG inventory are incomplete and have significant gaps (especially on energy balance). Furthermore, most of the available data areeither

aggregated or economy-wide. Data are more useful when sector and geographically specific. He urged ministries to improve data collection systems, while acknowledging that resources often limit the regular collection of data for international mandates. He noted that the GVN would welcome USAID assistance on calculation of Vietnam-specific emissions factors (EFs). The GVN is placing priority on developing a NAMAs framework, implementing related policies and programs, and establishing a measurement, reporting and verification (MRV) system in the near future although it currently lacks the financial resources to carry out these priorities. Mr. Hieu reiterated that maintaining a comprehensive, accurate, and up-to-date GHG inventory remains a priority of the GVN, noting that they are currently finalizing a revised inventory using 2005 base year emissions. The GHG inventory work will help GVN carry out its UNFCCC commitments and identify opportunities to develop a low-carbon economy. He recognized the Japan International Cooperation Agency (JICA) assistance on building capacity for a national GHG inventory from 2011-2014. JICA is and supporting the preparation of reports for submission to the UNFCCC in 2014, and improving the quality and management of the inventory. Despite this assistance, technologies and available data are limited, making the inventory challenging.

INTRODUCTION TO NAMAs

Mr. Matthew Ogonowski, *USAID*

Mr. Ogonowski presented an overview of NAMAs focusing on their history, potential financing mechanisms, key features, and implementation challenges to provide the participants with background prior to the workshop panels and later discussions. He mentioned his previous experience working on climate change policy development with a number of countries in Asia at the Center for Clean Air Policy (CCAP) and the Netherlands Development Organisation (SNV) in Vietnam.

Mr. Ogonowski outlined differences between NAMAs and the Clean Development Mechanism (CDM) established under the Kyoto Protocol. The CDM was intended to help developed countries meet emissions reductions targets by purchasing emission reduction offsets from developing countries while promoting sustainable development. NAMAs, on the other hand, are aimed at assisting developing countries with abatement of their emissions through transformational policies, projects, and strategies, identified and selected by the nations themselves and undertaken on a voluntary basis. Mr. Ogonowski provided some examples of NAMAs that have been proposed in Asia, including one in the cement sector in Vietnam. He noted that NAMAs are country-driven and can be supported solely from within a nation (domestic NAMAs) or enabled by international technology, financing or capacity development assistance (supported NAMAs). Potential international financing mechanisms for NAMAs include the private sector, bilateral funds, development banks, and the Green Climate Fund. Mr. Ogonowski also identified some key challenges associated with successfully developing and implementing NAMAs:

- The potentially large scale of NAMAs, which can be include sector-wide or cross-cutting actions
- MRV
- Treatment of co-benefits (in estimation, financing decisions and MRV)
- Crediting NAMAs (not currently recognized under the UNFCCC)
- Forestry sector NAMAs and their interaction with national REDD+ programs

Basic design elements to be considered when developing NAMAs include

- Sectors and technologies targeted
- Implementation policies and measures to be employed

- Ministries and agencies involved
- Estimated time for preparation and implementation
- Estimated GHG reductions and years
- Development impacts
- Cost (up-front and net total)
- Domestic and international resources committed
- International assistance requested (capacity development, financing, and technology transfer)

In addition to the basic design elements listed above, policymakers can build stronger NAMAs that may have an edge in obtaining funding by including additional features:

- Potential to be transformational
- Linking domestic and supported NAMAs
- Expanding scale
- Ensuring sustainability
- Seeking "low-hanging fruit" for domestic NAMAs while directing international funding to more difficult actions
- Linking NAMAs and LEDS
- Including a range of development Impacts (economic and social development, non-climate related environmental impacts)
- Including strategies for addressing leakage and permanence
- Enhancing institutional cooperation through horizontal and vertical coordination

A question and answer period followed Mr. Ogonowski's presentation:

- Question: How do you integrate NAMAs and LEDS?
    - Response: There is no single blueprint for integrating NAMAs and LEDS. NAMAs can be used as building blocks for a LEDS through the piloting of MRV systems and standards. It is important to remember that NAMAs are a near-term strategy, while LEDS entails a longer-term, ideally economy-wide approach.
- Mr. Nguyen: How do you approach addressing many sectors, when the technology costs to address all sectors are more expensive than the resources available?
    - Response: It is important to consider the emission reduction potential of key sectors and activities to use resources most efficiently and identify where it is possible to scale-up investments with outside support. However, there is no single "right answer".
- Lauren Altinger (World Bank): Developing more complex NAMA proposals that link sectors can be complicated and have high transaction and coordination costs. Would it be better for countries to start by considering simpler NAMAs to build momentum?

- Response: A country should focus on what is feasible and nationally appropriate. Considering a country's overall mitigation targets during the initial stages of NAMA development can save time and resources and reduce longer-term problems related to integrating NAMAs into broader LEDS and mitigation programs. These decisions are ultimately up to each country to determine what is most appropriate.

- Ms. Soojin Kim: I appreciate highlighting the possibility of forestry NAMAs and the relationship to REDD+ and wonder if NAMAs could reduce international emissions leakage between neighboring countries, such as Cambodia or Laos?
    - Response: NAMAs could be one way to target areas of REDD+ that are not captured, including international leakage. Multiple countries could propose joint or regional NAMAs to address leakage and secure international support to prevent losses that would not be captured in a national REDD+ Plan.

PANEL DISCUSSION: PREPARING AND IMPLEMENTING NAMAs

Panelists:

Dr. Dinh Vu Thanh, *MARD*

Mr. Quach Tat Quang, *MONRE*

Mr. Matthew Ogonowski, *USAID*

Moderator: Ms. Jette Findsen, *Abt Associates*

The objective of this panel was to provide a forum for the discussion of biogas and wind technologies, which have been identified as policy priorities by the GVN.

Dr. Dinh Vu Thanh, MARD

Dr. Thanh provided an overview of MARD activities on biogas. In 2011, MARD approved a proposal for reduced emissions from agriculture by 2020 focusing on rice cultivation, animal husbandry, and forestry. Widespread adoption of biogas technologies could help achieve the desired emissions reduction targets. MARD is currently implementing smallscale biogas programs in eighteen towns across Vietnam, and is looking to replicate that model to include 52 of the 64 total provinces. HAlthough small-scale biogas is prevalent in Vietnam, medium- and large-scale biogas are not well developed due to high maintenance and operation costs, the high level of technology required for fixed-cover biogas, and difficulties in treating wastewater. Dr. Thanh hopes i to expand MARD's program to include medium-, large-, and industrial-scale biogas associated with animal husbandry operations. The recommended that Vietnam look into opportunities for transferring large-scale biogas technology. MARD is considering how to participate in NAMAs and develop capacity for their implementations.

Mr. Quach Tat Quang, MONRE

MONRE has selected wind and biogas as potential NAMAs because results of previous pilot projects funded in 2012 and other data showed that these technologies as have great potential for further development in Vietnam. He encouraged participants to consider the linkage between NAMAs, LEDS, and low-carbon development. While NAMAs are not the only solution, they have potential to achieve a portion of a LEDS strategy.

Mr Quang acknowledged that significant barriers to wind implementation exist, including the costs of siting wind turbines, demand for the technology, financial feasibility, and access to the transmission grid. To encourage investments in this area, the GVN has already implemented feed-in tariffs and subsidies wind power.. Further GVN support is expected in 2014 and 2015 for wind power. Supported NAMAs

could provide necessary financial, technology transfer, and capacity development support to expand wind use in Vietnam.

Vietnam has extensive experience promoting small-scale biogas, including an SNV project that installed over 130,000 biogas digesters nationwide. This experience influenced MONREs decision to select biogas technologies for NAMAs. Mr. Quang noted that barriers to scaling-up biogas still exist despite the environmental and economic benefits.. Vietnam, unlike other countries, does not provide households using biogas technology with subsidies to offset the relatively high capital costs.. Mr. Quang c recommended that the GVN draft policies for biogas subsidies and establish a legal framework to support further adoption of wind and biogas technologies.

Matthew Ogonowski, USAID

Mr. Ogonowski was encouraged by the numerous areas where NAMAs could address the economic, social, and environmental priorities of Vietnam. When developing NAMAs, it is important to consider the various barriers in the design phase. He suggested that support for NAMAs focus on opportunities to remove barriers to scaled-up adoption of wind and biogas technologies.

In the subsequent discussion, participants and presenters raised the following issues:

- The interaction of CDM projects and NAMAs
    - In the near term, the global carbon market will likely have little impact on the development of new projects or NAMAs in Vietnam due to the lack of demand for carbon credits and the EU policy of only purchasing CDM credits from LDCs, which does not include Vietnam.
    - Existing tracking and MRV systems established under the CDM could be used as a model for NAMAs.
    - The potential for scaling up existing CDM activities into broader national and sub-national level NAMAs should be explored.
    - Lessons learned from the successes and failures of CDM in Vietnam can be applied to NAMAs.
- There is no "one size fits all" framework for the development of NAMAs.
- Criteria for selection of projects in Vietnam have been set. The prime minister has approved a method to calculate the criteria. Both of those documents are available online.
- The potential for other low-emission but nonrenewable energy technologies (nuclear and carbon capture and storage) to was raised.
- Development of rigorous standards is needed as NAMAs are scaled-up.
- The number of countries that have proposed NAMAs is not clear since many NAMA proposals are concept notes with limited detail. Only a handful of NAMAs have moved to implementation –examples include Mexico housing and South Africa renewable energy initiative.

Mr. Ogonowski remarked that Vietnam was already ahead of the curve, as demonstrated by the technical level of questions and considerations raised in the discussion. He stressed the importance of integrating NAMAs into Vietnam's broader development plans.

OVERVIEW OF AFTERNOON SESSIONS

Ms. Jette Findsen, *Abt Associates*

Lunch at the Hotel

PRESENTATION OF BIOGAS TECHNOLOGY AND MARKETS

Ms. Jette Findsen, *Abt Associates*

Ms. Findsen presented the results of an AILEG analysis on the biogas market in Vietnam including a discussion of biogas technology, mitigation costs, future potential, and financing mechanisms. She also provided an in-depth evaluation of the economic, environmental and cost and benefits. The study focused on generating electricity from biogas captured at medium- and large-scale farms.

The study noted major environmental benefits of using biogas from livestock methane, including reduced fuel stock usage, reduction of localized pollutants, and re-use of an existing waste stream. The environmental benefits are numerous, significant in scale, and widely understood in Vietnam.

Some key issues affecting wind and medium- and large-scale biogas in Vietnam are listed below:

1. Conventional energy prices are $54/MWh renewable energy is often more expensive. For wind power, the FiT helps offset some of the difference, but other barriers still exist. If feedstocks are assumed to be costless, , biogas has a 10 percent internal rate of return (IRR) when electricity costs $69/MWh and 15 percent at $87 per megawatt-hour . NAMAs should focusedon reducing the cost difference between biogas and conventional energy.

- Anaerobic respiration is the cheapest biogas technology.
- There are capital cost efficiencies from scaling up biogas, but technology barriers and the availability of a free waste stream, and public acceptance have limited adoption.
- The penetration rate for medium- to large-scale farms is only 0.5% (27,000 farms).
- Total energy was estimated from biogas using the number of animals and their manure production factors. Most of the potential energy is from small-scale biogas for heating and fuel, rather than electricity (approximately2.0 GW), but the large scale still represents 8% of electricity generation (0.7 GW).
- Barriers include 1) capital costs, 2) skilled workforce, 3) access to construction and maintenance materials, 4) scaling up technology adoption, 5) financial feasibility, 6) lack of a legal and regulatory framework (access to credit, market for the digestate, feed in tariff stability and /credibility), and 7) limited awareness of the technology.
- There is only one large-scale manure CDM project in Vietnam, and very few elsewhere in Asia. The one project in Vietnam had an IRR of 26%, but when the Certified Emission Reduction (CER) price dropped by 99 percent, the internal rate of return decreased to an unattractive level (below 10 percent).
- The CER price is not expected to rise above Euros 0.39-0.90 per ton over the next 7 years, unless demand and supply change significantly.

The biogas study concluded that:

- Technologies for capturing and using biogas are available and have potential at both the farm and household levels
- The viability of biogas is dependent on the cost of the feedstock, the markets for by-products, and the capital costs
- Other renewable energy sources may be more competitive for electricity without additional financing
- Financing, technical assistance, education, and legal and regulatory support are needed to promote biogas

- Many co-benefits of livestock biogas capture exist and are significant
- NAMA support can focus on an entire sector or be tailored to areas with more needs

Ms. Findsen presented case studies of three existing biogas projects: 1) a national program in Ethiopia that helped households obtain the capital costs for biogas installations; 2) a NAMA in Uruguay that leveraged financing to scale-up low-emissions technology development, adaptation, assessment, and transfer in agriculture and agroindustry production chains and strengthening national-level policy frameworks; and 3) a NAMA in Costa Rica for use of by-product coffee pulp as a fuel to dry coffee beans and subsidized sale of by-product ethanol to co-op members. This NAMA will use a variety of outside assistance including financing, capacity development, and technology transfer.

The Q&A session brought up the following topics:

- The existing south-south exchange of knowledge between Ethiopia and Vietnam on biogas
- Additional barriers to scaling-up biogas technology in Vietnam: 1) lack of large appliances that can use biogas, 2) inability to manufacture appliances and technologies locally, 3) need for increased awareness on slurry (digestate) application, 4) accessibility of biogas feedstocks, 5) need for greater coordination between ministries and donors, 6) commercial viability of a private sector role, 7) disparities in biogas potential across sub-sectors.
- A MONRE-DHMCC/GIZ project is conducting feasibility studies of biogas potential in Vietnam.
- Inclusion of solid waste treatment as potential for biogas NAMA
- Addressing flaring and gas leakage on farms where biogas capture exceeds demand
- Policy gaps, including lack of subsidies for biogas
- Accounting for additional benefits such as the impact on household budgets.
- Importance of MRV systems for NAMAs and the challenges of ensuring appropriate oversight in scaling-up biogas technology
- UNDP is working with MOIT on the selection of two pilot NAMAs. More coordination with MONRE is needed in this area.

PRESENTATION OF WIND TECHNOLOGY

Mr. Dan Bilello, *NREL*

Mr. Bilello gave an overview of wind technology, including a summary of Vietnam's experience with implementing wind technology and the current state-of-play of wind policy. He discussed Vietnam's technology priorities, barriers to implementing wind technology, and potential sources of financing.

He framed the discussion by mentioning that Europe, North America, India, and China are all global leaders in wind technology. He cited trends in the wind energy market: 1) wind turbines are getting bigger and more efficient (80 m turbines are now the standard), 2) GIS data and resource assessment are increasingly sophisticated methods of forecasting reliable wind sources, 3) the ability to attract financing is predicated on the availability of reliable wind resources, and 4) even if wind components are not manufactured locally, jobs are created in the construction and operation and maintenance.

Barriers in Vietnam include the need for infrastructure development and transmission planning, reliable grid access, MRV of wind products, siting and environmental considerations, improved data and measurement, capacity development for technical workforce, and ability to manage variability. These barriers highlight actions that government, academia, and developers could address in developing a NAMA.

To show how analytical methods for mapping wind resources have improved dramatically in recent years, Mr. Bilello presented a case study of the Thanh Hoa wind resource mapping that NREL worked on. Geospatial analysis can make the connections between resource availability and infrastructure apparent. However, the underlying data are often not available or at sufficient granularity to make such analyses possible.

Next, he highlighted economic/financial, institutional, and market constraints to wind deployment in Vietnam . Mr. Bilello discussed policy tools and trade-offs for wind power in Vietnam and key considerations:

- Near-term opportunities for progress by incorporating World Bank/ESMAP 80 m wind data to identify where utility-scale wind power is possible, to help meet the ambitious 6 GW wind energy target set by the GVN
- Coordinating analysis to address data gaps
- Incorporating climate resiliency and broader development goals when evaluating wind energy.

- Mr. Bilello clarified that the Thanh Hoa Wind Resource Mapping Exercise was a quick desk study to show the potential for mapping resource availability in Vietnam. He is not aware of any studies that currently exist for Vietnam on a smaller scale.
- General lack of experience with wind technology and turbines (currently Vietnam only has 3 wind farms). The technical feasibility may vary based by location.

CROSS-CUTTING CONSIDERATIONS FOR NAMA DEVELOPMENT FOR BIOGAS AND WIND

Mr. Dan Bilello, *NREL*

Cross-cutting considerations for NAMA development in the biogas and wind sectors in Vietnam include

- Finance needs and barriers
- Stakeholder involvement
- Work force readiness for supporting new technologies/processes
- Financing needs and barriers
- Technology availability
- Workforce readiness
- Stakeholder involvement
- Long-term sustainability
- Measurement, reporting, and verification
- Institutional arrangement for domestic implementation

Key barriers to the development of NAMAs h should be addressed:

- Technical and infrastructure barriers
    - New technologies (resource assessment data, equipment performance)
    - Lack of experienced developers Reduced opportunities for small projects
    - Infrastructure (transmission and distribution investment, access to wind resources)
    - Dissemination of project performance information

    - Need for training
- Policy/Market barriers
    - Pricing and policy consistency and clarity Land access and property rights
    - Lack of power purchase agreements (PPAs) to build developers' confidence that projects will be economically viable over the long-term
    - Permitting and contracting
- Options to address barriers
    - Expand wind resource and project data collection and make non-proprietary data publicly available
    - Educating/training the debt and equity providers on wind project financing and technology risk assessments
    - Changes in s incentives
    - Alignment of wind development objectives with other development priorities

PANEL DISCUSSION ON POLICY OPTIONS AND BARRIERS IN VIETNAM

Panelists:

Ms. Jette Findsen, *Abt Associates*

Mr. Matthew Ogonowski, *USAID*

Mr. Dan Bilello, *NREL*

Moderator: Shanika Amarakoon, *Abt Associates*

The participants discussed Vietnam's policy priorities and objectives for wind and biogas:

- There is no internationally formalized framework or guidelines for selecting NAMAs and Vietnam needs further assistance in drafting initial NAMAs. A representative from the Institute of Agriculture and Environment noted the major challenge in defining NAMAs in the absence of UNFCCC guidance. The best they can be done is to compare NAMAs with low carbon economy model or other mechanism to understand the mechanics of a NAMA policy.
- This workshop built momentum and technical capacity to better understand NAMAs and should lead to more detailed discussions guiding NAMA developments in the wind and biogas sectors.
- Coordination among ministries should be improved, particularly if more than one ministry is involved in promotion, regulation, or policy making.
- It is important to involve stakeholders outside of government as well since much of the experience in the wind and biogas sectors in Vietnam is through donors and NGOs.
- NAMAs need to balance the views of government agencies and donors to attract financial, technology transfer, and capacity development support.
- Request technical assistance from USAID on the design and development of MRV systems.

Day 1 CONCLUDING REMARKS AND INTRODUCTION TO DAY 2 AGENDA

Ms. Jette Findsen, *Abt Associates*

Ms. Findsen thanked the presenters and panelists for sharing their knowledge and leadership. She expressed her appreciation to the participants for the attention and thoughtful discourse they

contributed throughout the day. She summarized the general topic areas covered during the day and provided a brief overview of the Day 2 Agenda.

Day 2 Agenda

OPENING REMARKS AND SUMMARY OF DAY 2 AGENDA

Mr. Matthew Ogonowski, USAID

Mr. Ogonowski summarized Day 1 as the "What, Why, and When" of NAMA development in Vietnam. More specifically, Day 1 focused on 1) the current state of play of NAMAs in Vietnam, 2) potential strategies for developing NAMAs in the country, and 3) challenges and opportunities. at Day 2 will focus on t how to use methodologies /tools to estimate co-benefits of NAMAs, including models to estimate GHG emissions and support MRV

EVALUATING THE IMPACTS OF NAMAs Ms. Jette Findsen, *Abt Associates*

Potential impacts that should be considered in evaluating NAMAs include

- Environmental impacts: GHG emission reductions and air quality from decreased reliance on fossil fuels
- Social impacts: Health and quality of life
- Economic impacts: Workforce development and GDP (job creation, trade-offs, economic development, subsidies, pull the focus and strategy of ministries)

Ms. Findsen noted that investors are more likely to be attracted to projects that have significant co-benefits and MRV systems that account for the impacts.

TRACKING GHG IMPACTS OF NAMAs

Ms. Apurba Mitra, *World Resources Institute*

The World Resources Institute (WRI) developed a protocol developed by WRI to standardize the monitoring of GHG emissions to:

- Provide a consistent approach for quantifying GHG emissions;
- Provide guidance on emission and projections before, during, and after implementation of a NAMA; and,
- Address policies and standards d (e.g., regulations, taxes, tradable permits, subsidies and incentives, R&D policies, infrastructure programs, etc.)

Ms. Mitra reviewed the key steps for applying the framework:

- Chapter 5 provides guidance on whether to assess an individual policy or multiple policies.
- Chapter 7 reviews the boundary conditions and importance of accounting for emission sources that are external (outside of the boundary)
- Chapter 6 emphasizes the importance of evaluating the probability and magnitude of policy impacts Chapter 8 guides the development of the baseline scenario if new policies are not implemented.
- Chapter 9 addresses the quantification of GHG effects in the baseline scenario
- Chapter 10 addresses the quantification of GHG under a post implementation scenario

- Chapter 11 provides information on data collection and monitoring in implementation
- Chapter 12 reviews the importance of assessing uncertainty. Baseline emissions should be more conservative than alternative scenario/.s

Ms. Mitra reviewed WRI's tiered approach, in which Tier 1 is simpler and less accurate and Tier 3 requires more complete data and methods. As a country gains experience and additional data in developing and implementing NAMAs, it can move from a Tier 1 to Tier 3 approach. Microsoft Excel is sufficient for both Tier 1 and Tier 2 approaches.

In addition, she highlighted the importance of assessing intended and unintended effects f and determining whether policies are independent, overlapping, or reinforcing,:

- Independent policies have a combined impact equal to their separate impacts: even if they target the same source;
- Overlapping policies have a combined effect less than the sum of the individual policy components. The amount of overlap may affect whether it is worthwhile implementing all of these policies together; and
- Reinforcing policies have a combined effect greater than the sum of the individual policy components.

Some impacts may be overlapping, which others may be reinforcing. For example, for a wind power NAMA policy, it . might not be possible to see the full impact of a policy until you get down to the more granular level of impacts because of leakages in other sectors, emissions from pumping, the reduced cost of the technology, fossil fuel prices, and water usage. In addition, GHG emissions may only be one of many impacts. By evaluating each of the impacts, using IPCC default factors or m local-specific emissions factors.

Mr. Quang noted that the WRI tool seems complex and it may be useful to organize a training workshop to review it in more detail.

EVALUATING CO-BENEFITS OF NAMAs: PANEL PRESENTATIONS AND DISCUSSION

Mr. Quach Tat Quang, *MONRE*

Mr. Dan Bilello, *NREL*

Ms. Jette Findsen, *Abt Associates*

Mr. Matthew Ogonowski, *USAID*

Moderator: Shanika Amarakoon, *Abt Associates*

Mr. Bilello presented an overview of the co-benefits and co-costs of wind power:

- Economic (jobs, competitiveness, energy security)
- Social (health, energy access, quality of life)
- Environmental (local air quality, water use, biodiversity)

Mr. Bilello then presented NREL's Jobs and Economic Development Impact Model (JEDI) tool to estimate co-benefits. JEDI has been applied for projects in the United States and is developing countries. Ms. Findsen gave an overview of assessing the air quality and health effects of NAMAs. In assessing the effects of air quality on health, it is important to:

- Identify the change in emissions of non-GHG pollutants Estimate reductions in ambient air pollution at specific locations;
- Assess improvements in health outcomes taking into account the population patterns, epidemiological relationships, and baseline health data); and
- Estimate the value of reductions in premature mortality and morbidity

Ms. Findsen presented an example of a study of projected co-benefits of a proposed bus rapid transit co-benefits in Dhaka using a benefit transfer approach based on adapting a USEPA estimate of the value of a statistical life saved in the United States from an analysis of the increased wage differential for risky occupations to the Bangladeshi economy. This study concluded that the health co-benefits could be valued at $9.4 million. Some tools that can be used to estimate the air quality co-benefits include the Environmental Benefits Mapping and Analysis Program (BenMAP), Long-Range Energy Alternatives Planning (LEAP) model, and AirCounts.

In the discussion:

- MOIT was interested in learning more about how to apply co-benefit estimation tools.
- A CDM developer requested clarification on monetization of avoided deaths. The potential challenges of gathering data required for the analyses and tools were noted.
- Mr. Quang stated that development of NAMAs for biogas and wind are a priority to meet domestic and international targets for GHG emission reductions. He emphasized that this workshop has provided new insights on NAMAs and requested additional support on applying tools for co-benefit analysis. a.
- One participant noted that this was the fourth seminar on NAMAs in Vietnam. In a previous seminar, a definition for NAMAs was adopted, but it is not legally binding and no template is available for creating a NAMA. Ms. Findsen clarified that the framework for NAMAs is still being discussed on an international level, so there is no definite template. However, UNDP will soon release guidelines for NAMA development in Vietnam.

CLOSING REMARKS

Mr. Quach Tat Quang

Mr. Quang noted that this workshop was successful and discussed including technical considerations, policy gaps and barriers, and potential solutions and policy options. He hopes ministries will continue to look further into NAMAs. MONRE has been drafting preliminary NAMA guidelines that it will publish in the near future. He also thanked UNDP for its leadership in developing on NAMA guidelines. Mr. Quang hopes the collaboration facilitated at this workshop will contribute to tprogress on NAMAs on a national scale. He acknowledged that participants may have remaining questions on NAMAs and hopes they will maintain contact with experts and USAID for further capacity development after the workshop. He encouraged Vietnam to become a leader in both domestic and international NAMAs. s Mr. Quang thanked the organizers, donors, participants, speakers, and USAID and asked USAID to continue supporting the development of NAMAs in Vietnam.

CLOSING REMARKS

USAID

Matthew Ogonowski thanked the speakers and participating ministries. He looked forward to building this important partnership between USAID and Vietnam and hopes participants found the workshop useful. Mr. Ogonowski acknowledged Vietnam for their global leadership on NAMAs both in terms of

building experience and a policy framework and expressed his wish that they continue to lead in the future. Ms. Calderon reiterated her thanks to the presenters, organizers, panelists, and participants.